

Rev. 2/06		Bridge No.			
		Job No.			
<b>Missouri Department of Transportation</b> <b>Bridge Hydraulics and Scour Report</b>					
Designer					Date
Route		County		Stream	
<b>Purpose of Hydraulic/Scour Study</b> <i>(write a brief statement describing project and purpose of hydraulic study)</i>					

<b>National Flood Insurance Program Information</b>					
Has a flood insurance study been performed for the community? ( <a href="http://www.fema.gov/home/fema/csb.htm">www.fema.gov/home/fema/csb.htm</a> )					
Is the bridge in a special flood hazard area? (If yes, a floodplain development permit will be required)					
Is the bridge in a designated floodway? (If yes, a no-rise certification will be required)					
Has a Flood Insurance Rate Map (FIRM) been published for the area?					
What is the insurance rating for the site (A1, B, C, etc.)?					
Base (100-yr) Flood Elevation			Floodway width		
Map panel number			Map date		
Additional comments on Flood Insurance Study:					
<b>Discharge Data</b>					
Drainage Area			(mi <sup>2</sup> )		
Avg. slope between points 10% and 85% of valley length upstream					(ft/mi)
<b>Method of Analysis (choose one or more)</b>			<b>Q<sub>25</sub></b>	<b>Q<sub>50</sub></b>	<b>Q<sub>100</sub></b>
Missouri Rural USGS regression equations		Region =			
Missouri Urban (BDF) regression equations		BDF =			
Missouri Urban (%I) regression equations		% Impervious Area =			
Stream Gage		USGS Station Number =			
FEMA Flood Insurance Study		Community Name =			
Other		(Describe method)			

<b>Comments on Discharge calculations:</b> <i>(method chosen and why, expected level of upstream development, etc.)</i>
---

**Observed Extreme High Water**

Elevation		(ft)	Location		Date	
-----------	--	------	----------	--	------	--

**Comments on Observed Extreme High Water:** *(discharge, if known, etc.)*

**Discuss flow conditions in reach and describe any existing conditions that may influence hydraulic behavior in reach:**

**Streambed Slope**

<b>USGS Topo map:</b>					Quadrangle(s)
	Contour Interval =		Distance between contours =		
<b>Streambed Profile:</b>	Change in elevation =		Change in station =		
<b>Streambed Slope =</b>			(ft/ft)		

**Water Surface Profile Model**

**Model used:**

<input type="checkbox"/> River Analysis System (HEC-RAS)	<input type="checkbox"/> HEC-2
<input type="checkbox"/> Bridge Backwater Analysis (WSPRO)	<input type="checkbox"/> Other (describe)

**Which cross section was used in the model and why?**

**Describe the channel/overbank conditions and the roughness coefficients chosen:**

**Describe the existing and proposed bridges and the method used to model them:** *(Bridge loss calculation method, pier loss coefficients, etc.)*

**Water Surface Profile Model Results**

	Existing Conditions				Proposed Conditions			
Frequency	Q <sub>25</sub>	Q <sub>50</sub>	Q <sub>100</sub>	Q <sub>500</sub>	Q <sub>25</sub>	Q <sub>50</sub>	Q <sub>100</sub>	Q <sub>500</sub>
High Water Surface Elevation at Bridge (ft)								
Maximum Backwater (ft)								
Average Velocity in channel through Bridge (ft/s)								
Average Velocity through Bridge Opening (ft/s)								
Freeboard (ft)								
% of flow overtopping road								
Bridge overtopped?								

**Additional comments on water surface profile model:** *(backwater, velocities, unusual conditions, model errors, etc.)*

**Describe files used in water surface profile model:** *(HEC-RAS project and plan descriptions, WSPRO filenames and descriptions, etc.)*

### Scour Calculations

**General Information:** *(Describe soil conditions in streambed and overbanks:)*

**Comments on Contraction Scour calculations:** *(Note: Contraction scour depths greater than 6 feet should be viewed with some degree of skepticism.)*

**Comments on Pier Scour calculations:** *(Does the scour modeling account for the expected footing, was drift considered in determining pier widths, etc?)*

**Comments on Abutment Scour calculations:**

### Scour Calculation Results

	Calculated Scour Depths (ft)	
	100-year Flow	500-year Flow
Contraction Scour		
Pier Scour		
Left Abutment Scour		
Right Abutment Scour		

### Scour Protection Measures

**What measures are required to protect against scour?**

**Additional comments on scour calculations and/or scour protection:**

<b>General Information</b>
----------------------------

<b>Are there any improvements/buildings/crops/livestock that might be affected by alterations to the floodplain?</b> <i>(include description and estimated value)</i>
--

<b>Special Considerations:</b> <i>(Describe any other special conditions or considerations which affect this project)</i>
---

<b>Bridge Layout Summary</b>
------------------------------

Span Layout							
Loading		Roadway Width		Skew		Alignment	
Fill exception: Sta.				To Sta.			

**Design Exceptions:** *(Provide an explanation of any design exceptions requested and approved for this project)*

<b>Hydraulic Analysis Summary</b>
-----------------------------------

<b>Hydrologic Data</b>
Drainage Area = _____(sq.mi.)
<b>Backwater/Base Flood Data (100 year)</b>
High Water Elev. = _____
Design Discharge = _____(cfs)
Estimated Backwater = _____(ft)
Average Velocity thru Opening = _____(ft/s)
<b>Freeboard</b>
Design Frequency = _____(year)
Design Discharge = _____(cfs)
Freeboard = _____(ft)
Design High Water (DHW) Elev. = _____
<b>Roadway Overtopping</b>
Design Elev. (1' below shoulder) = _____
Design Discharge = _____(cfs)
Design Frequency = _____(year)